

CLAIMS

What is claimed is:

- 1 1. A beam alignment system, comprising:
2 a signal detector in a path of a beam carrying a traffic signal having a first wavelength
3 and an alignment signal having a second wavelength that allows a signal having the first
4 wavelength to be transmitted, the signal detector taking an intensity measurement of the
5 alignment signal;
6 a signal alignment unit that compares the intensity measurement of the alignment signal
7 to determine whether the alignment signal is aligned on the signal detector; and
8 a signal director that adjusts the path of the beam on the signal detector in response to the
9 determination of the signal alignment unit.
- 1 2. The beam alignment system of claim 1, further comprising a collimator unit that
2 collimates the beam.
- 1 3. The beam alignment system of claim 1, wherein the signal detector is a focusing lens
2 that focuses the traffic signal onto an optical cable.
- 1 4. The beam alignment system of claim 1, further comprising a focusing lens that
2 focuses the traffic signal onto an optical cable.
- 1 5. The beam alignment system of claim 3, wherein the signal detector and the optical
2 cable are positioned such that when the alignment signal is aligned on the signal detector the
3 traffic signal is aligned with a core of the optical cable

100240-247-072001

1 6. The beam alignment system of claim 1, wherein the signal detector comprises a
2 plurality of sensors that take intensity measurements of the alignment signal at a plurality of
3 positions on the signal detector.

1 7. The beam alignment system of claim 6, wherein the signal detector comprises a
2 quadrature detector

1 8. The beam alignment system of claim 1, wherein the signal director comprises micro-
2 electromechanical systems (MEMS).

1 9. The beam alignment system of claim 1, wherein the signal detector transmits signals
2 having wavelengths greater than 1300 nanometers.

1 10. The beam alignment system of claim 1, wherein the detector comprises Si.

1 11. The beam alignment system of claim 1, wherein the detector comprises InP .

1 12. The beam alignment system of claim 1, wherein the detector comprises GaP.

1 13. The beam alignment signal of claim 1, wherein the detector comprises GaAs.

1 14. The beam alignment system of claim 1, further comprising an alignment signal
2 generator that generates the alignment signal.

1 15. The beam alignment system of claim 14, wherein the alignment signal is encoded
2 with a pilot tone to aids in connection verification.

100270-24T01550

1 16. The beam alignment signal of claim 1, further comprising a signal coupler that
2 couples the alignment signal and the traffic signal onto the beam.

1 17. A beam alignment system, comprising:
2 a signal detector that absorbs a portion of a traffic signal, the signal detector taking an
3 intensity measurement of the portion of the traffic signal;
4 a signal alignment unit that compares the intensity measurement to determine whether the
5 traffic signal is aligned on the signal detector; and
6 a signal director that adjusts the path of the traffic signal on the signal detector in
7 response to the determination of the signal alignment unit.

1 18. The beam alignment system of claim 17, wherein the signal detector is a focusing
2 lens that focuses the traffic signal onto an optical cable.

1 19. The beam alignment system of claim 17, further comprising a focusing lens that
2 focuses the traffic signal onto an optical cable.

1 20. The beam alignment system of claim 18, wherein the signal detector and the optical
2 cable are positioned such that when the traffic signal is aligned on the signal detector the traffic
3 signal is aligned with a core on in the optical cable.

1 21. The beam alignment system of claim 17, wherein the signal detector comprises a
2 plurality of sensors that take intensity measurements of the traffic signal at a plurality of positions
3 on the signal detector.

100220-24701650

1 22. The beam alignment system of claim 21, wherein the signal detector comprises a
2 quadrature detector.

1 23. The beam alignment system of claim 17, wherein the signal director comprises
2 micro-electromechanical systems (MEMS).

1 24. The beam alignment system of claim 17, wherein the detector comprises Si.

1 25. The beam alignment system of claim 17, wherein the detector comprises InP.

1 26. The beam alignment system of claim 17, wherein the detector comprises GaP.

1 27. The beam alignment system of claim 17, wherein the detector comprises GaAs.

1 28. A method for managing a traffic signal, comprising:
2 transmitting a beam carrying the traffic signal having a first wavelength and an alignment
3 signal having a second wavelength to a signal detector that transmits signals having the first
4 wavelength;
5 obtaining intensity measurements of the alignment signal on the signal detector;
6 determining whether the alignment signal is aligned with the signal detector in response
7 to the intensity measurements;
8 adjusting a path of the beam to the signal detector in response to the determination; and
9 verifying connection via pilot tone.

1 29. The method of claim 28, further comprising:
2 generating the alignment signal; and

3 coupling the traffic signal with the alignment signal onto the beam.

1 30. The method of claim 28, further comprising collimating the beam before transmitting
2 the beam.

1 31. The method of claim 28, wherein transmitting the beam to the signal detector
2 comprises directing the beam with a plurality of micro-electromechanical systems (MEMS).

1 32. The method of claim 28, wherein obtaining measurements of the alignment signal
2 comprises measuring the alignment signal at a plurality of locations where the alignment signal is
3 incident on the signal detector.

1 33. The method of claim 28, wherein determining whether the alignment signal is aligned
2 with the signal detector in response to the intensity measurements comprises comparing the
3 intensity measurements with previous intensity measurements taken of an aligned alignment
4 signal.

1 34. The method of claim 31, wherein adjusting the path of the beam comprises adjusting
2 the positions of the MEMs.

1 35. A method for managing a traffic signal, comprising:
2 transmitting a beam carrying the traffic signal having a first wavelength to a signal
3 detector that transmits signals having the first wavelength;
4 obtaining intensity measurements of the traffic signal on the signal detector;
5 determining whether the traffic signal is aligned with the signal detector in response to
6 the intensity measurements; and

109910147-072001

7 adjusting a path of the beam to the signal detector in response to the determination.

1 36. The method of claim 35, wherein transmitting the beam to the signal detector
2 comprises directing the beam with a plurality of micro-electromechanical systems (MEMS).

1 37. The method of claim 35, wherein obtaining measurements of the traffic signal
2 comprises measuring the traffic signal at a plurality of locations where the traffic signal is
3 incident on the signal detector.

1 38. The method of claim 35, wherein determining whether the traffic signal is aligned
2 with the signal detector in response to the intensity measurements comprises comparing the
3 intensity measurements with previous intensity measurements taken of an aligned traffic signal.

1 39. The method of claim 36, wherein adjusting the path of the beam comprises adjusting
2 the positions of the MEMS.

1 40. A method for managing a traffic signal, comprising:
2 transmitting a first beam carrying an alignment signal having a first wavelength to a
3 signal detector that transmits signals having a second wavelength;
4 obtaining intensity measurements of the alignment signal on the signal detector;
5 determining whether the alignment signal is aligned with the signal detector in response
6 to the intensity measurements;
7 adjusting a path of the first beam to the signal detector in response to the determination;
8 and
9 transmitting a second beam carrying the traffic signal having a second wavelength and the
10 alignment signal having the first wavelength to the signal detector.

1 41. The method of claim 40, further comprising using beam encoding to aid in
2 connection verification.

1 42. The method of claim 41, wherein using beam encoding comprises using pilot tones.

09910147-072001